Testing and Disinfecting a Well

A private well can become contaminated when polluted water or other foreign matter enters the well. Wells with improperly sealed well caps may be subject to contamination from small rodents and insects. Shallow wells are more prone to contamination than deep drilled wells but either can become contaminated and should be tested for the presence of bacteria if a problem is suspected. The Essex Health Department recommends that homeowners with shallow dug wells have them tested for bacteria annually. The Health Department also recommends that a well's water be tested for bacteria if any conditions in or around the well have changed (e.g., the area surrounding the well has been flooded, the cap is damaged or deteriorated, the taste or odor of the water has changed, etc.). If the water test indicates the presence of bacteria, the well is considered contaminated and should be disinfected.

Department of Public Health Commissioner J. Robert Galvin, MD, MPH has said, "Unlike public drinking water systems serving many people, residents who rely on wells for their drinking water do not have experts regularly checking the water's source and its quality before it goes to the tap. These households must take special precautions to ensure the protection and maintenance of their drinking water supplies. For residents with wells, the flooding of homes or property could result in bacterial contamination of their well water."

Town residents whose drinking water comes from a private well should know how and when to disinfect their well should it become contaminated. If the well area has been flooded, any standing water around the well should be pumped away or allowed to recede. Shallow, dug wells should be uncovered, opened, and cleaned of any debris that may have entered the well casing. The sanitary well cap on a drilled well should be cleared, cleaned, and unbolted. A licensed electrician should evaluate any electrical connections that have been submerged.

Drinking water wells can be disinfected with unscented household 5.25% bleach (Clorox, for example). For effective disinfection, the recommended concentration of chlorine is 50ppm. Achieving the correct concentration is easiest if the homeowner knows the diameter and depth of the well. Drilled wells are usually 6 inches in diameter and 150 to 400 feet deep. Dug wells are usually 30 inches in diameter and 15 to 20 feet deep. The Essex Health Department has records of well depth for many homes in Essex. However, if no depth information is available, estimates are given below for the amount of bleach to use to disinfect a typical dug or drilled well.

The table below provides the number of gallons of water per foot of well for different diameter well casings.

Table 1. Volume of water per foot of pipe

Pipe diameter (in.)	Gal/ft of pipe
4	0.672
6	1.47
8	2.61
24	23.4
30	36.6
36	52.6

Find the number of gallons per foot of well pipe for your diameter well from the table above; multiply that number by the depth of your well (in feet) to get the approximate number of gallons of water that need to be disinfected. For example, if your well is 36 inches in diameter and 20 feet deep, the volume of water contained in the well is about 1050 gallons. The table below tells how much household bleach is needed to disinfect the total amount of water in the well.

Table 2. Volume of household bleach (liquid 5.25% Sodium Hypochlorite) needed to disinfect given volume of water.

Water Volume (gallons)	Volume of Bleach
150	16 fl. oz.
200	22 fl. oz.
300	1 qt.
500	2 qt.
1000	1 gal.
2000	2 gals.

In the example given above (36 inch diameter well, 20 feet deep, volume of water 1050 gallons) the amount of bleach needed would be 1 gallon. The bleach should be mixed with about 10 gallons of water in a bucket and poured into the well. If possible, a hose connected to a house sill cock or to the bottom of the storage tank (if there is a water treatment system) should be used to wash down the interior sides of the well pipe immediately after the bleach solution is added to the well. Turn off the hose when a strong odor of chlorine is detected. Replace the well cap after washing down the interior. Each faucet and tap (hot and cold) inside or outside the house should be opened and run until a distinct chlorine odor is observed; water should also be run in toilets, washers, and dishwashers until a chlorine odor is detected.

The chlorinated water should be allowed to stand in the well and pipes for at least 6 hours; preferably overnight. The system should then be flushed by allowing water to run from faucets or an outside hose bib (so as not to overload the septic system). Avoid running the chlorinated water onto grass and shrubbery as the chlorine will kill vegetation. Continue to run the system until the chlorine odor is gone. Some staining of fixtures may result from minerals in the water oxidized by the bleach; this does not affect

the quality of the water and should dissipate once the chlorine solution leaves the system. *Do not clean fixtures with products containing ammonia during the time that the chlorine is in the system as toxic fumes can result.* When all traces of chlorine are gone from the system, the water should be tested by a certified lab for the presence of bacteria. Labs can be found in the phone book or by contacting the Essex Health Department.

Examples:

1. Dug well, 30 inches in diameter, 12 feet deep. Volume of water in well is approximately 440 gallons. Use 1.5 quarts of bleach to disinfect.

2. Dug well, 30 inches in diameter, 18 feet deep. Volume of water in well is approximately 660 gallons. Use 2.5 quarts of bleach to disinfect.

3. Drilled well, 6 inches in diameter, 300 feet deep. Volume of water in well is approximately 440 gallons. Use 1.5 quarts of bleach to disinfect.

4. Drilled well, 6 inches in diameter, 400 feet deep. Volume of water in well is approximately 600 gallons. Use 2.5 quarts of bleach to disinfect.